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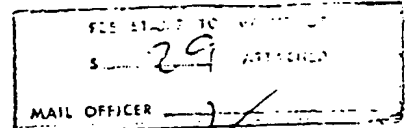
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Name of Applicant :

KEENEDGE GANGMOWERS LIMITED

Address of Applicant :

**Wall Place, Linden, Wellington,
New Zealand**

Actual Inventors

**JAMES BRIAN SMITH and
RAYMOND WILLIAM TREGURTHA**

Address for Service :

**Spruson & Ferguson, Patent Attorneys, Esso House,
127 Kent Street, Sydney, New South Wales, 2000 Australia.**

Complete Specification for the invention entitled :

**"IMPROVEMENTS IN AND RELATING TO
MOWING MACHINES"**

The following statement is a full description of this invention, including the best method of performing it known to me/us :

This invention relates to mowing machines and more particularly relates to those machines including supports mounting rotatable driven cutter assemblies and which are arranged to be wheeled or otherwise moved over the ground for mowing or cutting grass and other vegetation.

An object of this invention is to provide an improved construction of vegetation mowing machine having a minimum of moving parts and providing a compact construction.

10 Other and more particular objects and advantages of the invention will become apparent from the ensuing description.

According to this invention therefore, there is provided a vegetation mowing machine of the kind referred to comprising a support adapted to be moved over the ground and mounting a rotatable cutter assembly with a main drive shaft, and including a hydraulically operable motor coupled directly to said main drive shaft without intervening power transmission mechanisms, said hydraulic motor being arranged for operation by hydraulic power applied thereto by pipelines from a hydraulic power generating means remote from the cutter assembly.

20 The invention will now be described by way of example and with reference to the accompanying drawings in which:-

Figure 1 is a perspective view from above of a single mowing machine unit in accordance with the invention and which may be one of a plurality of similar units in a gang mower assembly arranged to be towed behind a vehicle such as a tractor;

30 Figure 2 is an exploded view of the mower unit

according to Figure 1; and

Figure 3 is an exploded view of one form of a hydraulic fluid reservoir and power source for the cutter assembly.

As with conventional grass mowers of this kind, the mower unit includes a main support frame, generally indicated by the arrow 1, mounted on two aligned ground wheels 2, one either side of the frame 1, and rotatably supporting a transverse fixed cutter member 3 and a transverse co-operating helically bladed reel cutter assembly 4 arranged for rotation about a horizontal transverse axis. Conventionally mower cutter reel assemblies are usually rotatable through drive mechanism connected to the ground wheels so that as the mower unit is towed or otherwise moved along the rotating ground wheels effect rotation of the reel cutter assembly; such constructions usually mean that grass can only be cut when the ground and grass is reasonably dry otherwise the ground wheels slip and the reel cutter assembly is subject to jamming and this can result in serious damage to the grass as the unit is moved along, particularly in cases where the ground wheels are provided with gripping spikes to minimise slip but jamming effects locking of the wheels and thus tearing of the grass and ground. It has also been known to provide mower units of the kind referred to with power drive to the wheels and thus indirectly to the connected cutter reel assembly, and also known to provide power drive means only for the reel but utilising chain or belt drive transmission means from the power source to effect rotation of the reel. In the present invention a substantially simplified and thus more economically produced and less troublesome

mower unit is provided by having a small hydraulic motor 5 mounted to one side of the unit main support 1 and coupled directly to the main horizontal drive shaft 6 of the cutter reel assembly 4, being co-axially in line therewith, without any intervening or supplementary power transmission means such as the aforementioned belts or chains, with appropriate pulley or sprocket reels or clutch means.

10 Hydraulic power for effecting operation of the small hydraulic motor 5 is provided by means of flexible conduits 7 extending from the hydraulic motor 5 at the unit to a hydraulic power generating source as shown by way of example in Figure 3 remote from the unit. The hydraulic power source can be that provided conventionally on a towing vehicle (not shown) but preferably an independent hydraulic pump unit 22 is provided and arranged to be driven, such as by way of a coupling drive shaft 23 and power transmission means 24, by the power take off unit normally provided on towing vehicles such as tractors. The hydraulic pump unit 22 may be provided also with its own indepenent hydraulic liquid reservoir 25, and appropriate valve and filter means 26 and control levers (not shown) as an independent self contained unit which may be readily attached to or detached from such as the normally provided three point linkage of a tractor arrangement, the reservoir support frame 26 having appropriate linkage attachment points 27, and such assembly may also include a connection for a tow bar or towing frame assembly to which one or more of mowing units in accordance with this invention are or can be attached for towing behind the vehicle e.g. a single unit can be towed behind a vehicle or a gang mower assembly comprising a plurality of similar

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units each individually driven by a hydraulic motor 5 as aforesaid with appropriate individual or interconnected flexible hydraulic pipe lines 7.

10 An additional feature of the present invention includes an improved tow bar connection 8 effectively forming a universal joint to permit hinging of the unit transversely and longitudinally relative to a tow bar 9 coupled to the unit so that individual units in a gang mower assembly are each capable of following ground contours. The hinge connection utilises a main transverse cylindrical member 10 of the support frame 1 having its end portions secured to side plates 11 of the main support 1, the hinged connection 8 comprising a transverse bar 12 disposed in parallel relationship above the main support bar and having downturned end portions extending between the support side plates with circular bearing members 12a located about end portions of the transverse support bar 12. The transverse bar 12 of the hinge connection 8 is arranged to abut stops 13 on the side plates 11 to limit movement to a required degree and is
20 further provided with a central circular tube connection 14 extending in the line of the path of the mower unit and arranged to be connected in pivoting engagement with a cylindrical rear end part of the towing connection 9 of a towing frame assembly.

30 The mower unit in accordance with this invention is further provided with rear transverse roller 15 with simple and quick action height adjustment means for varying the height of the cutter reel assembly 4 and co-operating cutter bar 3 above the ground level. Such adjustment means may comprise a bell crank lever arrangement 16 disposed on the

outer side of each side plate 11 of the support 1 for forward and rearward pivotal movement about aligned transverse axes 17 with the roller 15 being rotatably mounted between lower depending leg portions 16a of the levers 16 so that forward or rearward movement of such lever 16 in alignment can effect raising and lowering of the roller 15 relative to the main support 1. The two levers 16 may have portions extending upwardly from their pivotal connections 17 and be connected at their upper ends by a transverse locking bar 18 with downturned end parts 18a slidably engaged in and through bores provided in such lever upper end portions 16b, the lower end portions of the downturned end parts 18a of the transverse locking bar 18 being locatable in any one of a plurality of holes or recesses 19 spaced along the length of arcuate brackets 20 or plates provided on the outer side of each side plate 11 in juxtaposition with the lever member 16 and coaxially with their pivot axes 17. The lower end portions of the locking bar 18 are normally urged into engagement with the arcuate plates or brackets 20 such as by compression springs 21 located on the downturned end parts 18a of the locking bar so that the roller 15 height can be quickly and easily adjusted by upward or outward pulling of the locking bar 18 against the influence of the springs 21 and forward or rearward movement of such locking bar 18 to pivot the levers 16 to the required positions, locking of the levers 16 in the required positions being effected by release of the locking bar 18 for re-engagement with the arcuate side plates or brackets 20.

Thus, by this invention, there is provided a simplified and improved construction of mower unit for grass

or other vegetation and which has an independently driven cutter assembly 4 not connected to the ground wheels 2, which are free-running and can be provided with pneumatic tyres, so that the unit is usable in wet as well as dry conditions with a minimum risk of damage to the grass and ground.

10 A particular form of the invention has been described and illustrated by way of example, but it will be appreciated that other variations of and modifications to the invention can take place without departing therefrom. For example, it is envisaged that the unit can be provided with skids instead of wheels or, particularly in the case of an individual unit, can be arranged for support above the ground by the towing vehicle e.g. the three point linkage of a tractor, without direct ground support. The invention is not confined to commercial or large scale use as features of the invention may be applicable to smaller units for home lawn use.

The claims defining the invention are as follows:-

1. A vegetation mowing machine comprising a support adapted to be moved over the ground and mounting a rotatable cutter assembly with a main drive shaft, and including a hydraulically operable motor coupled directly to said main drive shaft without intervening power transmission mechanisms, said hydraulic motor being arranged for operation by hydraulic power applied thereto by pipelines from a hydraulic power generating means remote from the cutter assembly.

2. A mowing machine as claimed in claim 1, wherein said machine is provided with a pair of free running ground wheels disposed one either side thereof.

3. A mowing machine as claimed in claim 1 or claim 2, wherein the hydraulic power generating means comprises an independent hydraulic pump unit adapted for mounting on a towing vehicle and to be driven by a power take off unit of said vehicle.

4. A mowing machine as claimed in any one of claims 1, 2, 3 inclusive wherein said machine is provided with a universal joint towing connection permitting hinging of the machine transversely and longitudinally relative a tow-bar for the machine.

5. A mowing machine as claimed in claim 4 and having its towing connection substantially as described with reference to Figures 1 and 2 of the drawings.

6. A mowing machine as claimed in any one of the preceding claims and including a height adjustment means for varying the cutter reel assembly height substantially as hereinbefore described with reference to Figures 1 and 2 of

the drawings.

7. A mowing machine as claimed in any one of the preceding claims wherein the hydraulic power generating means is a self-contained unit comprising an independent hydraulic liquid reservoir with valve and filter means and control levers and mounting a hydraulic pump unit said self-contained unit including a support arrangement with attachment points arranged for detachable engagement with a three point linkage system of a tractor having a power take off unit.

8. A mowing machine assembly according to claim 7 and including an interconnected gang of the mowing machines according to any one of claims 1 to 7 inclusive.

9. A gang mower assembly arranged and constructed substantially as hereinbefore described with reference to the accompanying drawings.

DATED this TWENTY-FIRST day of OCTOBER, 1976.

KEENEDGE GANGMOWERS LIMITED

Patent Attorneys for the Applicant
SPRUSON & FERGUSON

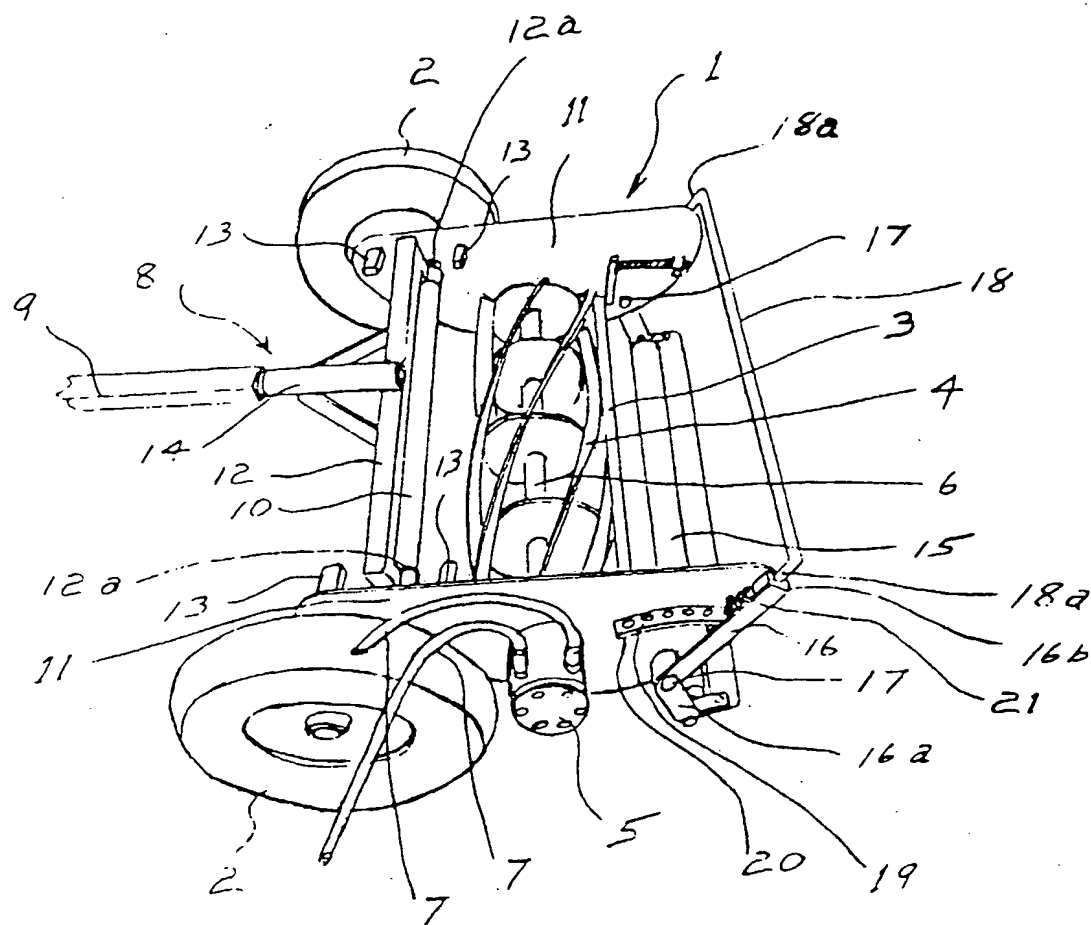


FIG. 1

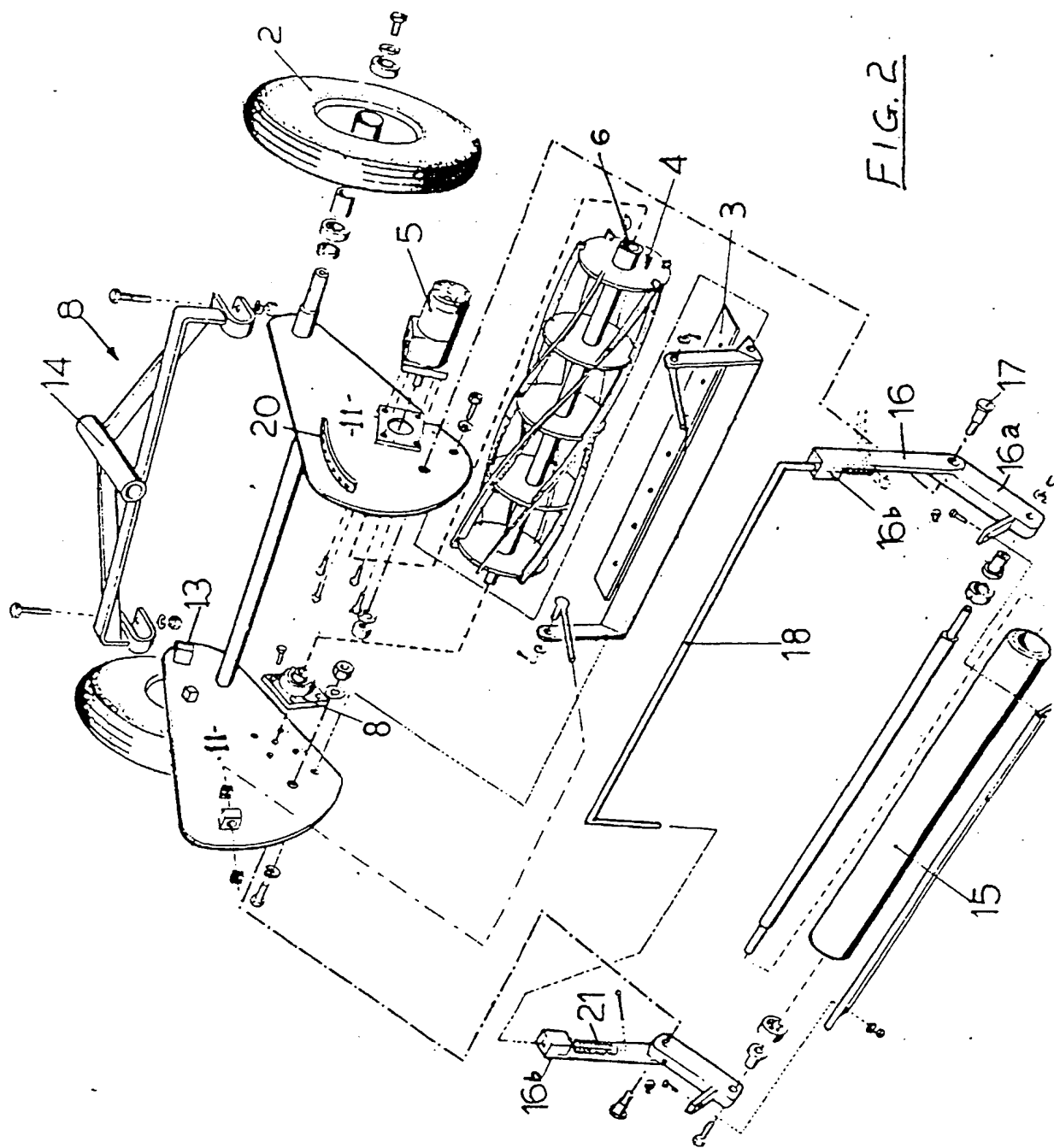
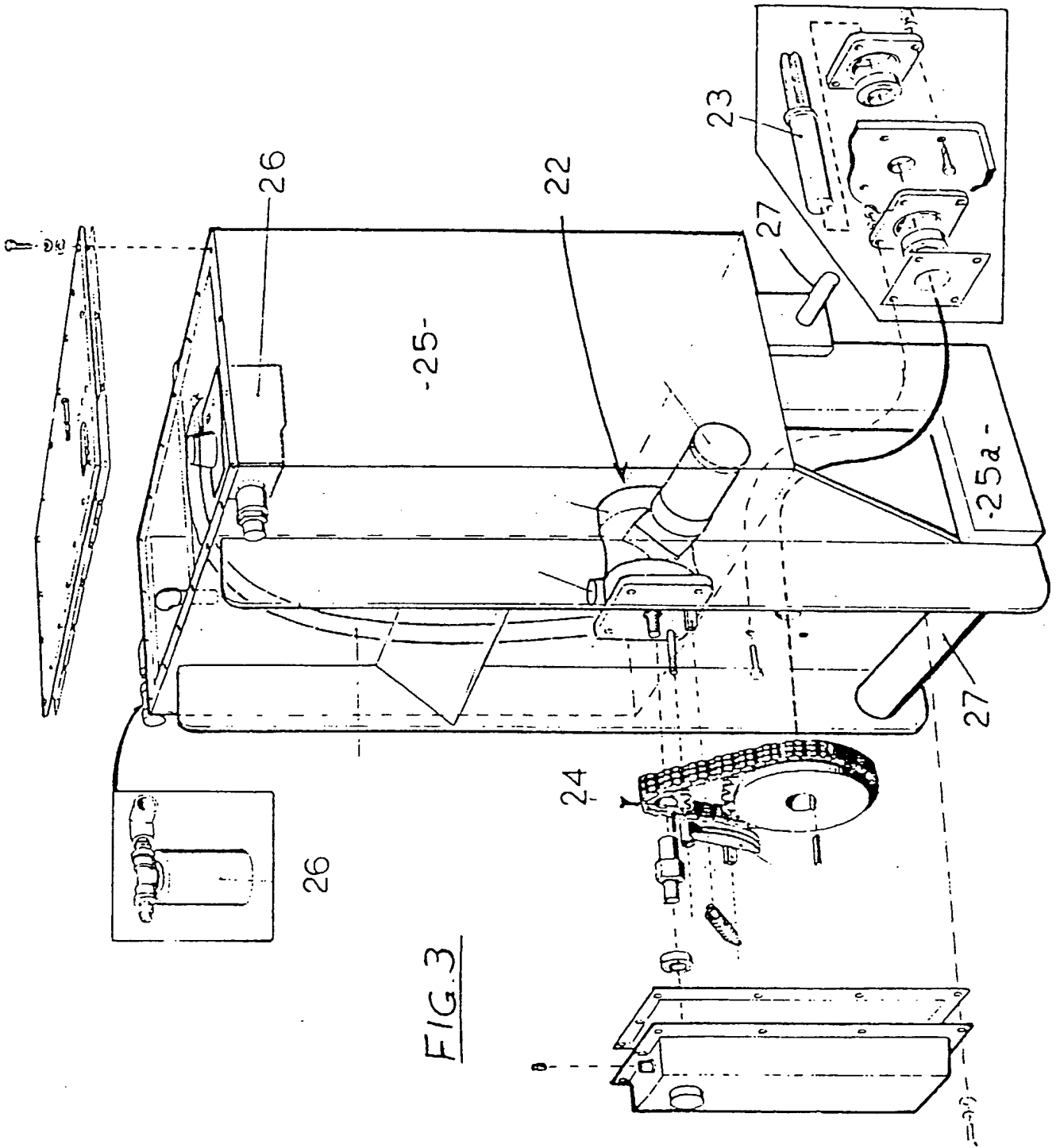


FIG. 2



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